SUPER●®

SUPER P4SGA
SUPER P4SGL
SUPER P4SGR
SUPER P4SGE

USER'S MANUAL

Revision 1.1c

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Preface

About This Manual

This manual is written for system integrators, PC technicians and knowledgeable PC users. It provides information for the installation and use of the SUPER P4SGA/P4SGL/P4SGR/P4SGE motherboard. The P4SGA/P4SGL/P4SGR/P4SGE supports single Intel Pentium® 4 1.5 - 3.06 GHz processors at a system bus speed of 533/400 MHz (3.0 GHz and 400 MHz only for P4SGL).   Refer to the support section of our web site (http://www.supermicro.com/TechSupport.htm) for a listing of supported processors. Single 478-pin Pentium 4 processors are housed in a 478-pin microPGA (Plastic Grid Array) package. This product is intended to be professionally installed.

Manual Organization

Chapter 1 includes a checklist of what should be included in your mainboard box, describes the features, specifications and performance of the P4SGA/P4SGL/P4SGR/P4SGE mainboard and provides detailed information about the chipset.

Chapter 2 begins with instructions on handling static-sensitive devices. Read this chapter when installing the processor and DDR memory modules and when mounting the mainboard in the chassis. Also refer to this chapter to connect the floppy and hard disk drives, the IDE interfaces, the parallel and serial ports, the mouse and keyboard and the twisted wires for the power supply, the reset button, the keylock/power LED and the speaker.

If you encounter any problems, see **Chapter 3**, which describes troubleshooting procedures for the video, the memory and the setup configuration stored in CMOS. For quick reference, a general FAQ (Frequently Asked Questions) section is provided. Instructions are also included for contacting technical support. In addition, you can visit our web site at www.supermicro.com/techsupport.htm for more detailed information.

Chapter 4 includes an introduction to BIOS and provides detailed information on running the CMOS Setup utility.

Appendix A provides AwardBIOS POST Codes.
Appendix B lists AwardBIOS POST Messages.
Appendix C lists AwardBIOS Error Beep Codes.

Table of Contents

Chapter 3: Troubleshooting

Chapter 4: AwardBIOS

Appendices:

Chapter 1
Introduction

1-1   Overview

Checklist

Congratulations on purchasing your computer motherboard from an ac-knowledged leader in the industry. Supermicro boards are designed with the utmost attention to detail to provide you with the highest standards in quality and performance.

Please check that the following items have all been included with your motherboard. If anything listed here is damaged or missing, contact your retailer.

All Included with Retail Box Only

One (1) Supermicro Mainboard

One (1) ATA66/100 ribbon cable for IDE devices

One (1) floppy drive ribbon cable

One (1) serial port (COM) cable

One (1) CPU retention bracket

One (1) USB 4-port cable (retail only)

One (1) I/O shield

One (1) Supermicro CD or diskettes containing drivers and utilities

One (1) User's/BIOS Manual

SCSI Accessories (P4SGR only)

One (1) 68-pin LVD SCSI cable

One (1) set of SCSI driver disketttes

One (1) SCSI manual

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Notes

SUPER P4SGA/P4SGL

Figure 1-1.   SUPER P4SGA/P4SGL Image*
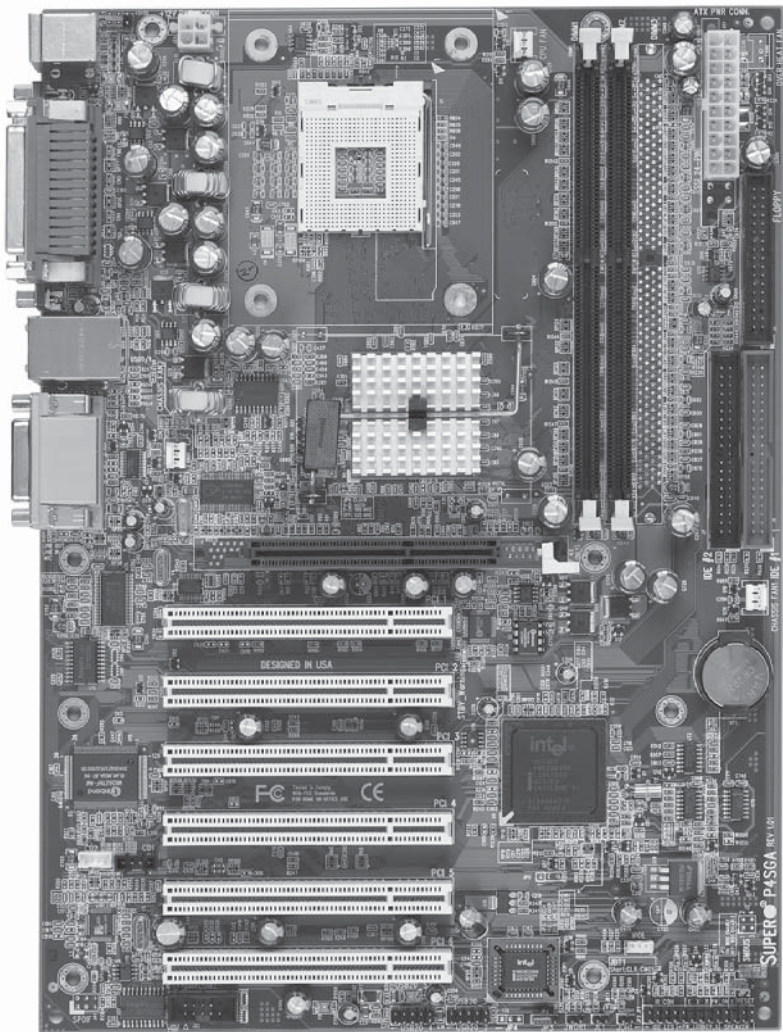
* The P4SGL has the same layout but no 4xAGP slot.

SUPER P4SGR/P4SGE

Figure 1-2.   SUPER P4SGR/P4SGE Image*
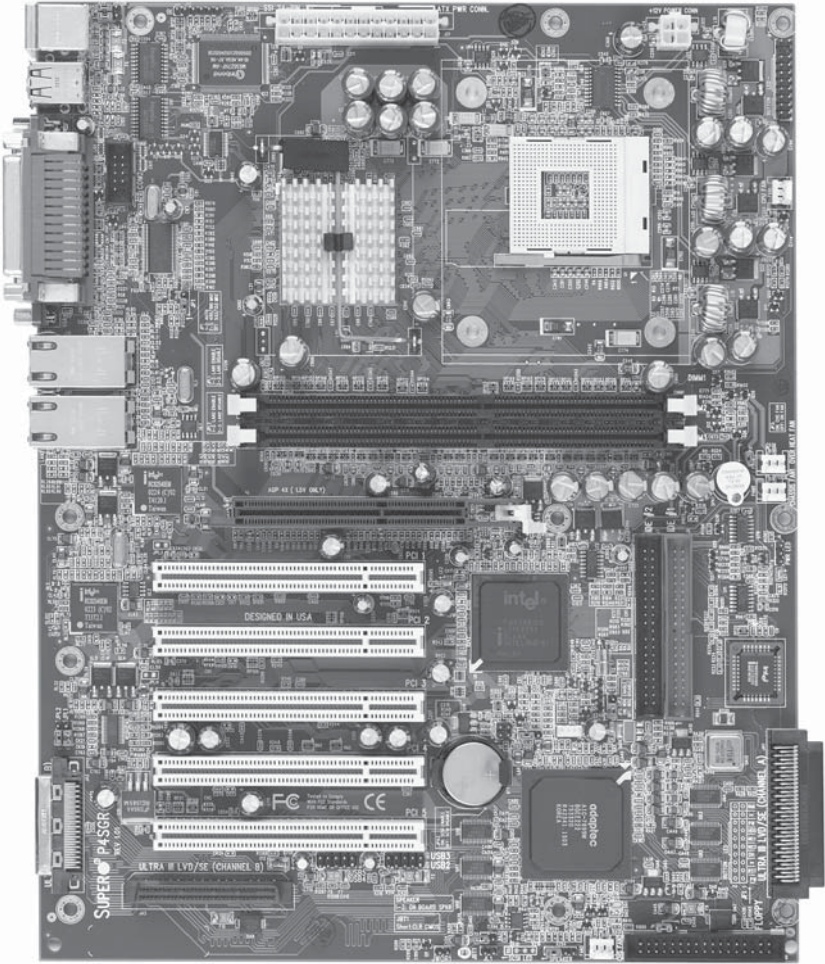
* The P4SGE has the same layout but no onboard SCSI.

Figure 1-3. Motherboard (P4SGA//P4SGL) Layout*
(not drawn to scale)
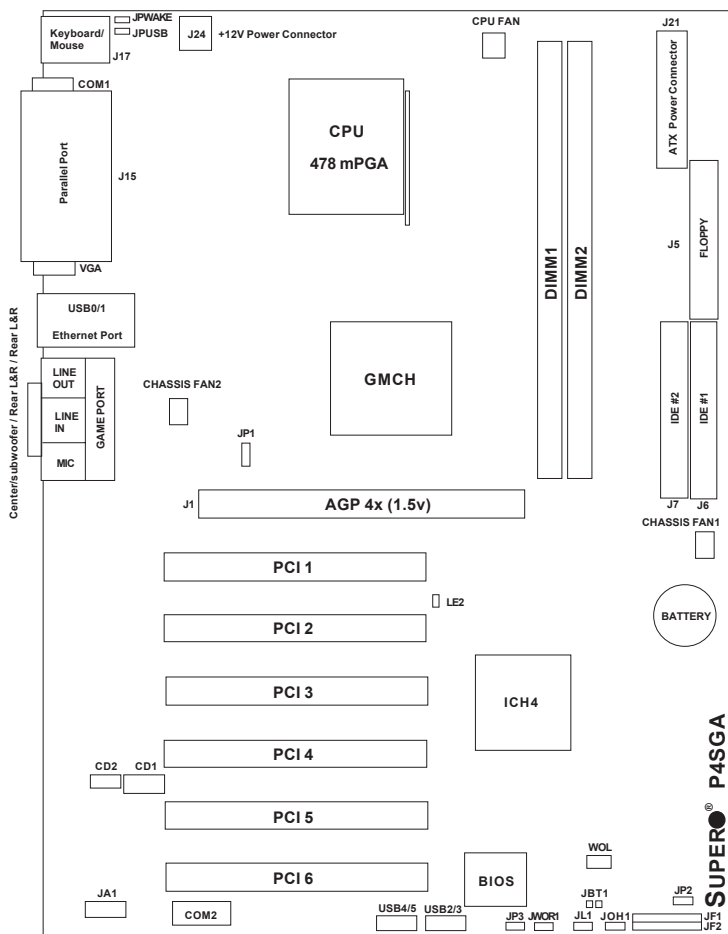
*The P4SGL has the same layout but no 4xAGP slot.

*The P4SGA+ has the same layout - see page 1-11 for differences.

See Chapter 2 for detailed information on jumpers, I/O ports and JF1/JF2 Front Panel connections.

Jumpers not indicated are for test purposes only.

P4SGA/P4SGL Quick Reference

Jumpers	Description	Default Setting
JBT1	CMOS Clear	See Section 2-7
JP1	Front Side Bus Speed	Pins 1-2 (Auto)
JP2	Watch Dog Enable	Open (Disabled)
JP3	Speech Output Select	Pins 1-2 (Speaker)
JPUSB	USB0/1 Wake Up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-Up	Pins 1-2 (Disabled)

Connectors	Description
CD1	Audio CD Input (large connector)
CD2	Audio CD Input (small connector)
Chassis Fan1/2	Chassis Fan Header
COM1/COM2	COM1/COM2 Serial Port Connector/Header
CPU Fan	CPU Fan Header
DIMM1/2	Memory (DIMM) Slots
Ethernet	LAN (Ethernet Port)
Game Port	Game Port
J1*	4xAGP
J5	Floppy Disk Drive Connector
J6/J7	IDE #1/#2 Hard Disk Drive Connectors
J15	Parallel Printer Port
J17	PS/2 Keyboard/Mouse
J21	ATX 12V Power Connector (20-pin)
J24**	ATX 12V Power Connector (4pin)
JA1	SPDIF Connector
JF1, JF2	Front Control Panel
JL1	Chassis Intrusion Header
JOH 1	Overheat LED
JWOR1	Wake-On-Ring Header
LE2	5v Standby Warning LED
LINE IN	Audio In Connector
LINE OUT	Audio Out (Speaker) Connector
MIC	Microphone Input
USB2/USB3	Universal Serial Bus Port 2/3
USB4/USB5	Universal Serial Bus Port 4/5
WOL	Wake-On-LAN

* P4SGA only

** The 4-pin connector at J24 must be connected to meet the safety requirements of the ATX 12V specifications.

Figure 1-4. Motherboard (P4SGR/P4SGE) Layout*
(not drawn to scale)

Keyboard/Mouse J17 JPWAKE JPUSB J12 J21 ATX Power Connector +12V Power Connector J24

USB0/1

COM1

COM2

Parallel Port J15

VGA

LAN1

LAN2

JP1

GMCH

JOH1

CPU
478 mPGA

JF1

CPU FAN

DIMM1

DIMM2

JP3

Speaker

OVERHEAT FAN

AGP 4x (1.5v)

CHASSIS FAN1

PCI 1 LE2

PCI 2

PCI 3

PCI 4

PCI 5

ICH4

IDE #2 IDE #1

BIOS

JPA3 WOL JP2 J7 J6

BATTERY

AIC-7899

USB4/5 USB2/3

SCSI Channel A

JPL2 JPL1 SUPER® P4SGR

SCSI Channel B

JA2 SCSI Channel B JA3

JA1

JBT1 JPA2 CHASSIS FAN2 JPA1
JWOR1 JL1 Speaker FLOPPY J5

*The P4SGE has the same layout but no onboard SCSI.

See Chapter 2 for detailed information on jumpers, I/O ports and JF1 Front Panel connections.
Jumpers not indicated are for test purposes only.

P4SGR/P4SGE Quick Reference

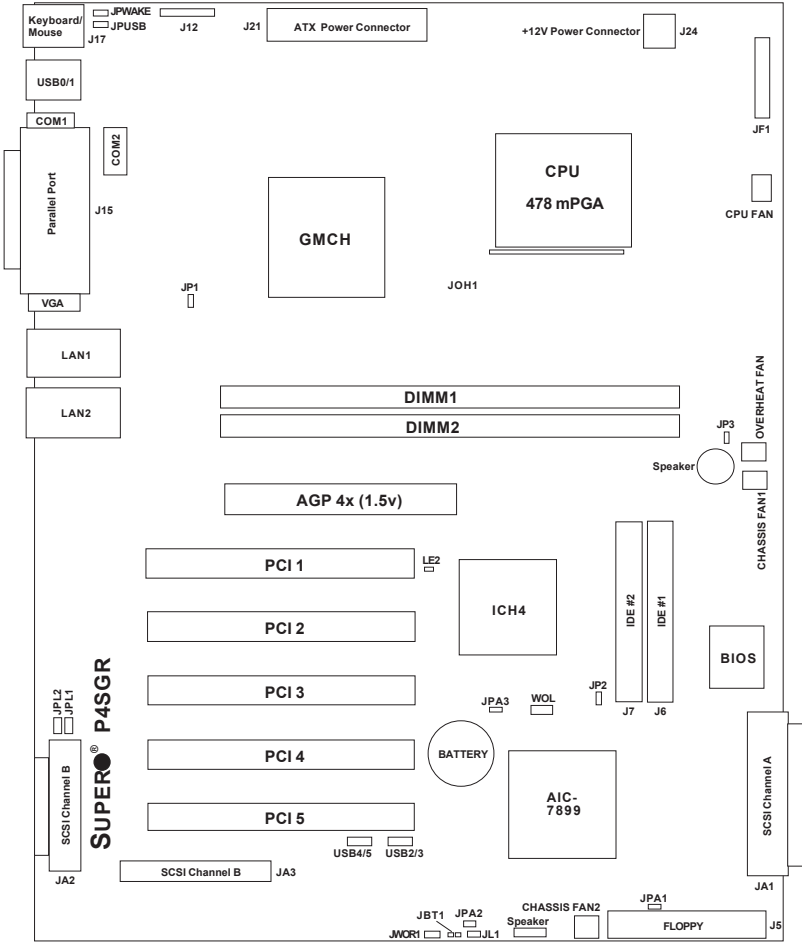| Jumpers	Description	Default Setting
JBT1	CMOS Clear	See Section 2-7
JP1	Front Side Bus Speed	Pins 1-2 (Auto)
JP2	Watch Dog Enable	Open (Disabled)
JP3	Fan Select	Open (OH Fan)
JPA1*	SCSI CH A Termination	Open (Enabled)
JPA2*	SCSI CH B Termination	Open (Enabled)
JPA3*	SCSI Enable/Disable	Pins 1-2 (Enabled)
JPL1/JPL2	LAN1/LAN2 En/Dis	Pins 1-2 (Enabled)
JPUSB	USB0/1 Wake Up	Pins 1-2 (Disabled)
JPWAKE	Keyboard Wake-Up	Pins 1-2 (Disabled)

Connectors	Description
Chassis Fan1/2	Chassis Fan Header
COM1/COM2	COM1/COM2 Serial Port Connector/Header
CPU Fan	CPU Fan Header
DIMM1/2	Memory (DIMM) Slots
J1	4xAGP
J5	Floppy Disk Drive Connector
J6/J7	IDE #1/#2 Hard Disk Drive Connectors
J12	Infrared Header
J15	Parallel Printer Port
J17	PS/2 Keyboard/Mouse
J21	ATX 12V Power Connector (20-pin)
J24**	ATX 12V Power Connector (4pin)
JA1/JA2/JA3*	Ultra160 SCSI Channel A/B/B
JF1	Front Control Panel
JL1	Chassis Intrusion Header
JOH 1	Overheat LED
JWOR1	Wake-On-Ring Header
LAN1/LAN2	Gb Ethernet Ports
LE2	5v Standby Warning LED
Overheat Fan	Overheat (Thermal) Fan
USB0/1	Universal Serial Bus Port 0/1
USB2/3/4/5	Universal Serial Bus Header 2/3/4/5
WOL	Wake-On-LAN

* P4SGR only

** The 4-pin connector at J24 must be connected to meet the safety requirements of the ATX 12V specifications.
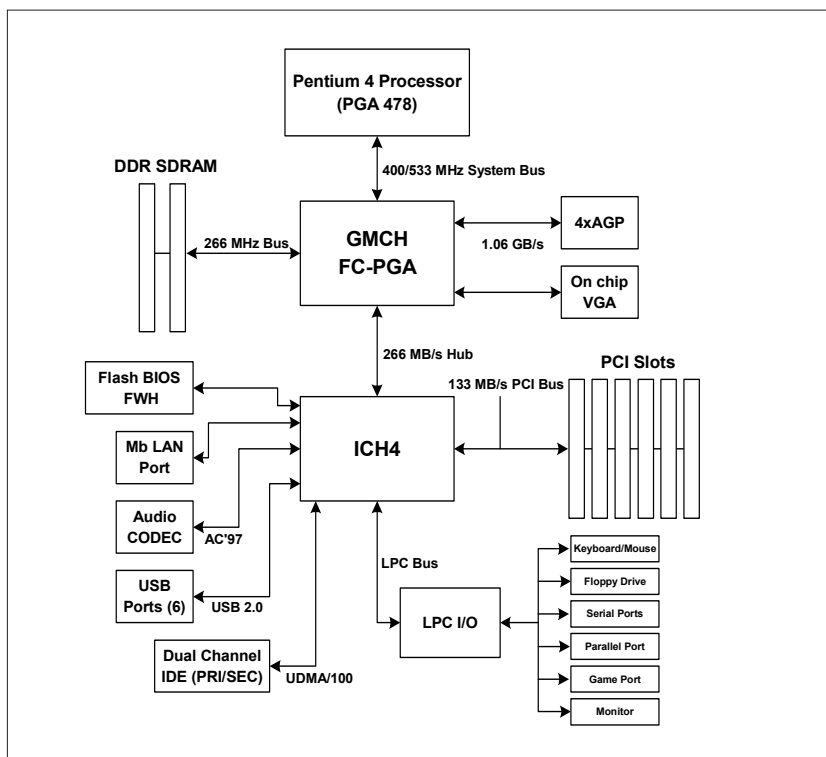
**Figure 1-5. 845G* Chipset:
System Block Diagram**

Note: This is a general block diagram and may not exactly represent the features on your motherboard. See the following pages for the actual specifications of each motherboard.

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*The 845GL (for the P4SGL) is the same but does not include support for AGP and supports a 400 MHz System Bus only.

*The 845GE (for the P4SGR, P4SGE and P4SGA+) is the same but supports PC2100 and PC2700 (DDR-266/DDR-333) only.

Motherboard Features

CPU ◆ *Latest CPU technology!*
• Single Pentium® 4 478-pin mPGA 1.5 - 3.06 GHz processors at a 533/
  400 MHz system bus speed. P4SGL: 400 MHz system bus only.
  (P4SGA+: same as P4SGA but also supports hyper-threading.)

Memory ◆ *Latest memory technology!*
• Two 184-pin DIMM slots for up to 2 GB of non-ECC unbuffered
  PC2100/1600 (DDR-266/200) SDRAM (PC2700/2100 for P4SGR/P4SGE/
  P4SGA+)
  Note: See Section 2-4 for details.

Chipset ◆ *Latest Intel chipset technology!*
• Intel 845G Chipset - P4SGA
• Intel 845GL Chipset - P4SGL
• Intel 845GE Chipset - P4SGR/P4SGE/P4SGA+

Expansion Slots
• Six 32-bit, 33 MHz PCI slots (P4SGA/P4SGL/P4SGA+)
• Five 32-bit, 33 MHz PCI slots (P4SGR/P4SGE)
• One 1.5V 4xAGP slot (P4SGA/P4SGR/P4SGE)

BIOS ◆ *With the latest voice BIOS technology for POST messaging!**
• 4 Mb Firmware Hub AwardBIOS® Flash BIOS
• APM 1.2, DMI 2.3, PCI 2.2, ACPI 1.0, Plug and Play (PnP)

PC Health Monitoring
• Nine onboard voltage monitors for CPU core, chipset voltage, +3.3V,
  +3.3V standby, +5V, +5V standby, Vbat (battery voltage) and ±12V
• Fan status monitor with firmware/software on/off control
• SuperDoctor II Utility
• Environmental temperature monitoring and control
• Power-up mode control for recovery from AC power loss
• System overheat LED and control
• System resource alert
• Hardware BIOS virus protection
• Auto-switching voltage regulator for the CPU core

*P4SGA/P4SGL/P4SGA+ only

ACPI Features

- Microsoft OnNow
- Slow blinking LED for suspend state indicator
- BIOS support for USB keyboard
- Real-time clock wake-up alarm
- Main switch override mechanism
- Internal/external modem ring-on

Onboard I/O

- Dual Ultra DMA 100 IDE Bus Masters
- Adaptec AIC-7899W for dual channel Ultra160 SCSI (P4SGR only)
- 1 floppy port interface (up to 2.88 MB)
- 2 Fast UART 16550A compatible serial ports
- 1 10/100 Mb LAN Ethernet port (works with integrated MAC - P4SGA/ P4SGL/P4SGA+)
- Intel 82540EM Gb Ethernet Controller for dual Gb ports (P4SGR/P4SGE)
- 1 EPP (Enhanced Parallel Port) and ECP (Extended Capabilities Port) supported parallel port
- PS/2 mouse and PS/2 keyboard ports
- Integrated high-perfomance "on-chip" Intel Extreme Graphics
- 1 game port with audio (P4SGA/P4SGL/P4SGA+) ◆ *Latest onboard 6-channel sound technology!*
- Up to 6 USB (Universal Serial Bus) ports ◆ *Latest USB 2.0 technology!*
- 1 infrared port

Other

- Wake-on-LAN (WOL)
- Multiple CPU clock frequency ratio selections (set in BIOS)
- AC97' CODEC
- Suspend-to-RAM
- Onboard +5vsb warning LED ("LE2")

CD Utilities

- BIOS flash upgrade utility
- Drivers and software for 845GE/845G/845GL chipset utilities

Dimensions

- P4SGA/P4SGL/P4SGA+: ATX form factor, 12" x 8.7" (305 x 221 mm)
- P4SGR/P4SGE: ATX form factor, 12" x 9.5" (305 x 241 mm)

1-2   Chipset Overview

Intel's 845G chipset (P4SGA) is made up of two primary components: the Graphics Memory Controller Hub (GMCH) and the I/O Controller Hub (ICH4). The 845GL (P4SGL) and 845GE (P4SGR/P4SGE) chipsets also include these components, however the 845GL provides no AGP support and only a 400 MHz system bus speed and the 845GE supports faster memory.

Graphics Memory Controller Hub (GMCH)

The GMCH includes the host (CPU) interface, memory interface, ICH4 interface and 4xAGP interface for the 845G/GL/GE chipset. It contains advanced power management logic and supports a single channel of DDR SDRAM. The AGP 2.0 interface supports 4x data transfers and operates at a peak bandwidth of 1.6 GB/s.

An external graphics accelerator card is not required due to the integrated graphics in the 845G/GL/GE chipset. (If the system BIOS detects an external AGP device, it will disable the integrated graphics.) The integrated graphics controller delivers 3D, 2D and video capabilities, including video conferencing applications. The controller does not utlilize local memory, but accesses graphics data located in system memory at speeds matching that of the SDRAM installed. It also includes a cache controller to avoid frequent memory fetches of recently accessed texture data.

I/O Controller Hub (ICH4)

The ICH4 is a fourth-generation I/O Controller Hub subsystem that integrates many of the input/output functions of the chipset, including a two-channel ATA100 Bus Master IDE controller. The ICH4 also interfaces with the PCI cards, the AC'97 Audio CODEC and the various communications ports. Nearly all communications between the GMCH and the ICH4 takes place over the hub Interface, which is a 66 MHz/266 MB/s bus.

Recovery from AC Power Loss

BIOS provides a setting for you to determine how the system will respond when AC power is lost and then restored to the system. You can choose for the system to remain powered off (in which case you must hit the power switch to turn it back on) or for it to automatically return to a power on state. See the Power Lost Control setting in the BIOS chapter of this manual to change this setting. The default setting is Always OFF.

1-3 PC Health Monitoring

This section describes the PC health monitoring features of the SUPER P4SGA/P4SGL/P4SGR/P4SGE. The motherboard has an onboard System Hardware Monitor chip that supports PC health monitoring.

Nine Onboard Voltage Monitors for the CPU Core, Chipset Voltage, +3.3V, +3.3V standby, +5V, +5V standby, Vbat and ±12V

The onboard voltage monitor will scan these voltages continuously. Once a voltage becomes unstable, it will give a warning or send an error message to the screen. Users can adjust the voltage thresholds to define the sensitivity of the voltage monitor.

Fan Status Monitor with Firmware/Software On/Off Control

The PC health monitor can check the RPM status of the cooling fans. The onboard 3-pin fans are controlled by the power management functions.

Environmental Temperature Control

The P4SGA/P4SGL/P4SGR/P4SGE has a CPU "thermal trip" feature. A thermal control sensor monitors the CPU temperature in real time and will send a signal to shut down the system whenever the CPU temperature exceeds a certain threshold. This works to protect the CPU from being damaged by overheating.

CPU Overheat LED and Control

This feature is available when the user enables the CPU overheat warning function in the BIOS. This allows the user to define an overheat temperature. When this temperature is exceeded, the CPU thermal trip feature will activate and shut down the system.

Hardware BIOS Virus Protection

The system BIOS is protected by hardware so that no virus can infect the BIOS area. The user can only change the BIOS content through the flash utility provided by Supermicro. This feature can prevent viruses from infecting the BIOS area and destroying valuable data.

Auto-Switching Voltage Regulator for the CPU Core

The 3-phase-switching voltage regulator for the CPU core can support up to 60A current and auto-sense voltage IDs ranging from 1.1V to 1.85V. This will allow the regulator to run cooler and thus make the system more stable.

1-4 Power Configuration Settings

This section describes features of your motherboard that deal with power and power settings.

Microsoft OnNow

The OnNow design initiative is a comprehensive, system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests.

Slow Blinking LED for Suspend-State Indicator

When the CPU goes into a suspend state, the chassis power LED will start blinking to indicate that the CPU is in suspend mode. When the user presses any key, the CPU will wake-up and the LED will automatically stop blinking and remain on.

BIOS Support for USB Keyboard

If the USB keyboard is the only keyboard in the system, it keyboard will function like a normal keyboard during system boot-up.

Real Time Clock Wake-Up Alarm

Although the PC may be perceived to be off when not in use, it is still capable of responding to preset wake-up events. In the BIOS, the user can set a timer to wake-up the system at a predetermined time.

Main Switch Override Mechanism

When an ATX power supply is used, the power button can function as a system suspend button. When the user depresses the power button, the system will enter a SoftOff state. The monitor will be suspended and the

hard drive will spin down. Depressing the power button again will cause the whole system to wake-up. During the SoftOff state, the ATX power supply provides power to keep the required circuitry in the system alive. In case the system malfunctions and you want to turn off the power, just depress and hold the power button for 4 seconds. The power will turn off and no power will be provided to the motherboard.

Wake-On-Ring Header

Wake-up events can be triggered by a device such as the external modem ringing when the system is in the SoftOff state. Note that external modem ring-on can only be used with an ATX 2.01 (or above) compliant power supply.

Wake-On-LAN (WOL)

Wake-On-LAN is defined as the ability of a management application to re-motely power up a computer that is powered off. Remote PC setup, up-dates and asset tracking can occur after hours and on weekends so that daily LAN traffic is kept to a minimum and users are not interrupted. The motherboards have a 3-pin header (WOL) to connect to the 3-pin header on a Network Interface Card (NIC) that has WOL capability. Wake-On-LAN must be enabled in BIOS. Note that Wake-On-Lan can only be used with an ATX 2.01 (or above) compliant power supply.

1-5   Power Supply

As with all computer products, a stable power source is necessary for proper and reliable operation. It is even more important for processors that have high CPU clock rates of 1 GHz and faster.

The SUPER P4SGA/P4SGL/P4SGR/P4SGE accommodates 12V ATX power supplies. Although most power supplies generally meet the specifications required by the CPU, some are inadequate. You power supply must supply 1 amp of 5V standby voltage.

It is strongly recommended that you use a high quality power supply that meets 12V ATX power supply Specification 1.1 or above. Additionally, in areas where noisy power transmission is present, you may choose to install a line filter to shield the computer from noise. It is recommended that you also install a power surge protector to help avoid problems caused by power surges.

It also provides two high-speed, 16550 compatible serial communication ports (UARTs), one of which supports serial infrared communication. Each UART includes a 16-byte send/receive FIFO, a programmable baud rate generator, complete modem control capability and a processor interrupt system. Both UARTs provide legacy speed with baud rate of up to 115.2 Kbps as well as an advanced speed with baud rates of 250 K, 500 K, or 1 Mb/s, which support higher speed modems.

The Super I/O provides functions that comply with ACPI (Advanced Configuration and Power Interface), which includes support of legacy and ACPI power management through a SMI or SCI function pin. It also features auto power management to reduce power consumption.

The IRQs, DMAs and I/O space resources of the Super I/O can be flexibly adjusted to meet ISA PnP requirements, which suppport ACPI and APM (Advanced Power Management).

1-6   Super I/O

The disk drive adapter functions of the Super I/O chip include a floppy disk drive controller that is compatible with industry standard 82077/765, a data separator, write pre-compensation circuitry, decode logic, data rate selection, a clock generator, drive interface control logic and interrupt and DMA logic.   The wide range of functions integrated onto the Super I/O greatly reduces the number of components required for interfacing with floppy disk drives.   The Super I/O supports four 360 K, 720 K, 1.2 M, 1.44 M or 2.88 M disk drives and data transfer rates of 250 Kb/s, 500 Kb/s or 1 Mb/s.

Chapter 2
Installation

2-1   Static-Sensitive Devices

Electric Static Discharge (ESD) can damage electronic components. To prevent damage to your system board, it is important to handle it very carefully. The following measures are generally sufficient to protect your equipment from ESD.

Precautions

• Use a grounded wrist strap designed to prevent static discharge.
• Touch a grounded metal object before removing the board from the anti-static bag.
• Handle the board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
• When handling chips or modules, avoid touching their pins.
• Put the motherboard and peripherals back into their antistatic bags when not in use.
• For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Installation Procedures

Follow the procedures as listed below for full installation of the motherboard into a chassis:

1. Install the processor and the heatsink to the motherboard.

2. Install the motherboard in the chassis.

3. Install the memory and add-on cards.

4. Finally, connect the cables and install the drivers.

2-2   Processor and Heatsink Fan Installation

⚠ **!**

When handling the processor package, avoid placing direct pressure on the label area of the fan.

IMPORTANT: Always connect the power cord last and always remove it before adding, removing or changing any hardware components. Make sure that you install the processor into the CPU socket before you install the CPU heatsink.

Installation of the Processor and Heatsink

1. Locate the following components, which are included in the shipping package.

Clips (2)

Bracket (1)

Note: The CPU heatsink fan with clips is included only with the retail versions of the P4SGA/P4SGL/P4SGR/P4SGE. If you buy a boxed Intel Pentium 4 478/Northwood processor, it should include a heatsink, fan and retention mechanism. If you buy a processor separately, use only a Supermicro or Intel certified heatsink and fan.

2. Insert the white pegs into the black anchors. Do not force the white pegs all the way in - about 1/3 of the white pegs should be inside the black anchors. (These are for chassis that do not have four CPU retention holes.)

Bracket in position
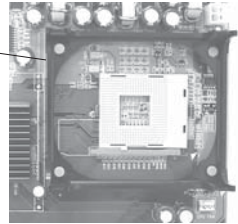
3. Place a retention bracket in the proper position and secure it by pressing two pegs into the retention holes until you hear a *click*. The clicking sound indicates that the peg is locked and secured.

4. Secure the other retention bracket into position by repeating Step 3.

5. Lift the lever on the CPU socket.
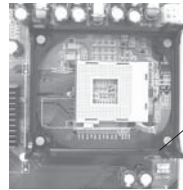
Socket Lever
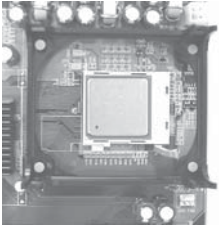
6. Install the CPU in the socket. Make sure that Pin 1 of the CPU is seated on Pin 1 of the socket (both corners are marked with a triangle).

7. Press the lever down until you hear it *click* into the locked position.

Socket lever in locked position
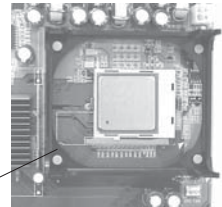
8. Apply the proper amount of thermal compound to the CPU die.

9. Place the heatsink on top of the CPU and press firmly downward - do not twist or slide the heatsink to seat thermal compound.

10. Secure the heat sink by locking the retention clips into their proper position.
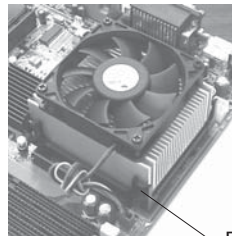
Retainer clip attachment point

11. Connect the CPU fan cable to the CPU Fan header on the motherboard.
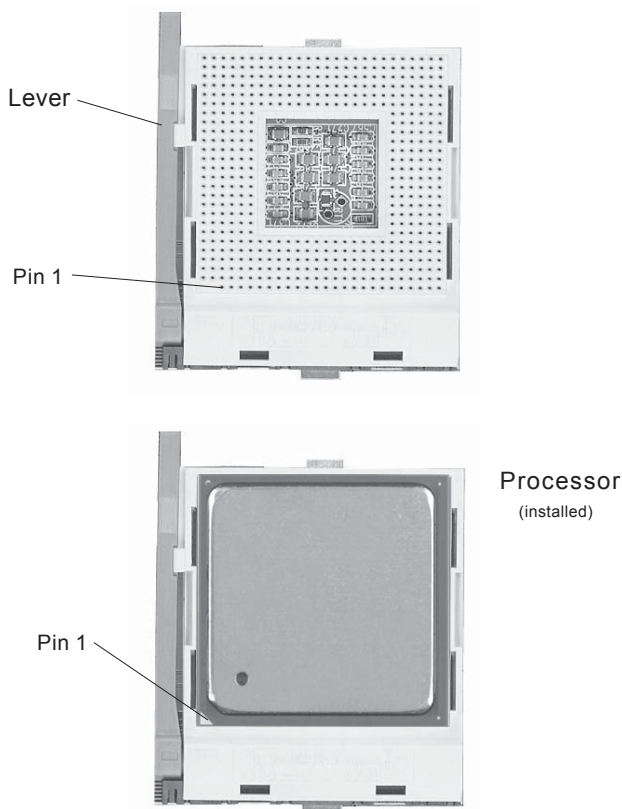
Figure 2-1. 478-pin mPGA Socket: Empty and with Processor Installed

2-3 Mounting the Motherboard in the Chassis

All motherboards have standard mounting holes to fit different types of chassis. Make sure the location of all the mounting holes for both the motherboard and the chassis match. Although a chassis may have both plastic and metal mounting fasteners, metal ones are highly recommended because they ground the motherboard to the chassis. Make sure the metal standoffs click in or are screwed in tightly. Then use a screwdriver to secure the motherboard onto the motherboard tray.

2-4   Installing DDR Memory

CAUTION
Exercise extreme care when installing or removing memory modules to prevent any possible damage.

Memory Module Installation (See Figure 2-2)

1. Insert each DDR memory module vertically into its slot. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly.   (See support information below.)
2. Gently press down on the memory module until it snaps into place.
3. Two 184-pin memory sockets support up to 2 GB unbuffered non-ECC DDR type SDRAM (see support information below).

Support
The P4SGA/P4SGL supports both double-sided and single-sided non-registered, unbuffered PC2100 (DDR-266) or PC1600 (DDR-200) SDRAM. The P4SGR/P4SGE/P4SGA+ supports both double-sided and single-sided non-registered, unbuffered PC2700 (DDR-333) or PC2100 (DDR-266) SDRAM.   Always populate DIMM1 first.

Figure 2-2.   Side and Top Views of DDR Module Installation into Slot

To Install: Insert module vertically and press down until it snaps into place. Pay attention to the notch.

Notch → DDR ← Notch

Release Tab   Release Tab

Note: Notch should align with the receptive point on the slot
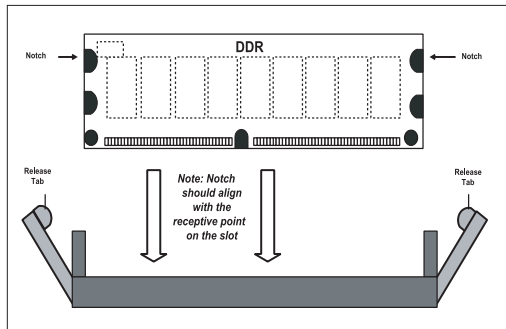
To Remove: Use your thumbs gently to push each release tab outward to release the DIMM from the slot.

Top View of DDR Slot

Release Tab   Release Tab
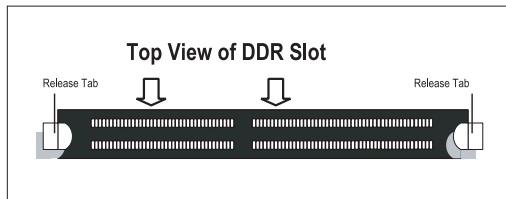
2-5   I/O Port/Control Panel Connector Locations

The I/O ports are color coded in conformance with the PC99 specification to make setting up your system easier. See Figure 2-3 below for the colors and locations of the various IO ports.

Figure 2-3.   I/O Port Locations and Definitions

P4SGA/P4SGL

Mouse (Green)   Parallel Port (Burgundy)   Game Port (Gold)

LAN Port

Keyboard   COM1 Port (Turquoise)   VGA Port (Blue) USB 0/1 Ports   Line Out / Line In / Mic

(Purple)   (Lime) / (Light Blue) / (Pink)

P4SGR/P4SGE

Mouse (Green)   Parallel Port (Burgundy)

Keyboard   USB 0/1 Ports COM1 Port (Turquoise)   VGA Port (Blue)   LAN1   LAN2

(Purple)
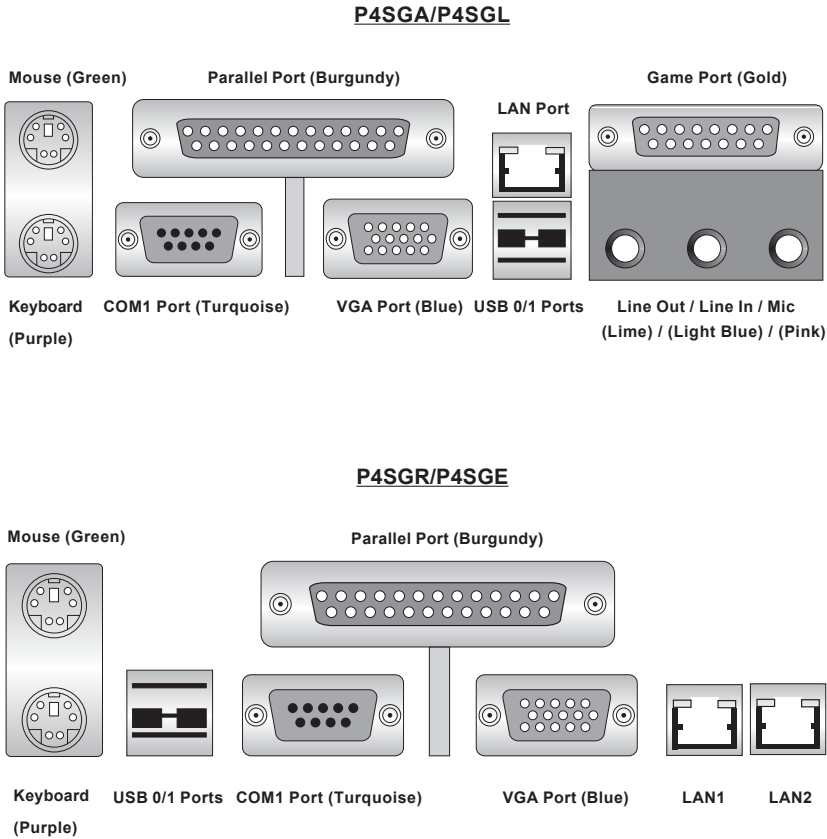
Front Control Panel

JF1/JF2 (P4SGA/P4SGL) and JF1 (P4SGR/P4SGE) contain header pins for various front control panel connectors. See Figure 2-4 for the pin definitions of the various connectors included speaker. Refer to Section 2-6 for details.

Figure 2-4. Front Control Panel Connectors

P4SGA/P4SGL
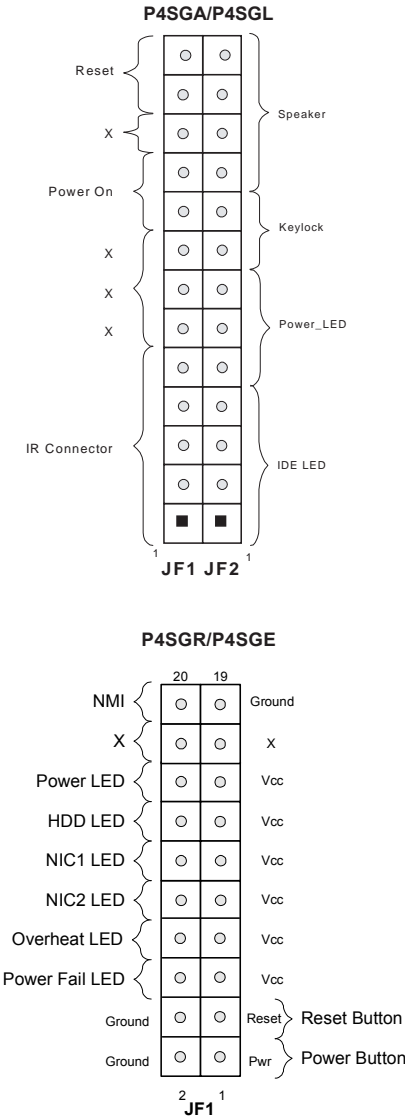
P4SGR/P4SGE

2-6   Connecting Cables

Power Supply Connectors

The primary power supply connec-
tor on the P4SGA/P4SGL/P4SGR/
P4SGE meets the SSI (Superset
ATX) 20-pin specification. Refer
to the table on the right for the pin
definitions of the ATX 20-pin
power connector. You must also
connect the 4-pin J24 power con-
nector to your power supply. Re-
fer to the table below right for the
J24 (12V) connector.

ATX 20-pin Power Connector
Pin Definitions (J21)

Pin #	Definition	Pin #	Definition
11	+3.3V	1	+3.3V
12	-12V	2	+3.3V
13	COM	3	COM
14	PS_ON	4	+5V
15	COM	5	COM
16	COM	6	+5V
17	COM	7	COM
18	-5V	8	PW-OK
19	+5V	9	5VSB
20	+5V	10	+12V

+12V 4-pin PWR
Connector
(J24)

Pins #	Definition
1 & 2	Ground
3 & 4	+12 V

Required

Connection

PWR Supply
Color Definition

Color	Definition
Orange	+3.3V
Black	Com
Red	5V
White	Power OK
Yellow	+12V
Purple	5V standby
Brown	-5V
(For reference only)	

IR Connector

The infrared connector is located
on pins 1-5 of JF1 on the P4SGA/
P4SGL and on J12 on the P4SGR/
P4SGE. See the tables on the right
for pin definitions. Refer to the
Technical Support section of our
web page for information on the
infrared devices you can connect
to the system.

Infrared
Pin Definitions
(JF1)

Pin Number	Definition
1	+5V
2	CIR
3	IRRX
4	Ground
5	IRTX

Infrared
Pin Definitions
(J12)

Pin Number	Definition
1	+5V
2	CIR
3	IRRX
4	Ground
5	IRTX
6	NC

PW_ON Connector

The PW_ON connector is located on pins 9 and 10 of JF1 on the P4SGA/P4SGL (1 and 2 on the P4SGR/P4SGE). This header should be connected to the chassis power button, which you may also configure to put the system into suspend mode (see the Power Button Mode setting in BIOS). To turn off the power when the suspend mode is enabled, depress the power button for at least 4 seconds. See the table on the right for pin definitions.

PW_ON
Pin Definitions
(JF1)

Pin Number	Definition
9	PW_ON
10	Ground

Reset Connector

The reset connector is located on pins 12 and 13 of JF1 on the P4SGA/P4SGL (3 and 4 on the P4SGR/P4SGE). This connector attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Pin
Definitions
(JF1)

Pin Number	Definition
12	Ground
13	Reset

IDE LED

The IDE LED is located on pins 1 to 4 of JF2 on the P4SGA/P4SGL (13 and 14 of JF1 on the P4SGR/P4SGE). This connects to the hard drive LED to display hard drive activity. See the table on the right for pin definitions.

IDE LED
Pin Definitions
(JF2)

Pin Number	Definition
1	+5V
2	HD Active
3	HD Active
4	+5V

Power_LED Connector

The Power LED connector is located on pins 5-7 of JF2 on the P4SGA/P4SGL (15 and 16 of JF1 on the P4SGR/P4SGE). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

**Power_LED
Pin Definitions (JF2)**

Pin Number	Definition
5	+5V
6	Key
7	Control

Keylock Connector

The keylock connector is located on pins 8 and 9 of JF2 on the P4SGA/P4SGL. See the table on the right for pin definitions.

**Keylock
Pin Definitions
(JF2)**

Pin Number	Definition
8	+5V
9	Control

Speaker Connector

The speaker connector is located on pins 10 to 13 of JF2 on the P4SGA/P4SGL. See the table on the right for pin definitions.

**Speaker Pin
Definitions (JF2)**

Pin Number	Function	Definition
10	+	Red wire, Speaker data
11	Key	No connection
12	Key	No connection
13	-	Speaker data

Serial Ports

Two serial ports are included on the motherboard: COM1 is a port located beside the mouse/keyboard ports and COM2 is a header located on the motherboard near PCI slot 6. See the table on the right for pin definitions.

**Serial Port Pin Definitions
(COM1, COM2)**

Pin Number	Definition	Pin Number	Definition
1	CD	6	DSR
2	RD	7	RTS
3	TD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Note: Pin 10 is included on the header but not on the port.

*NC indicates no connection.

CD Header (P4SGA/SGL)

There are two 4-pin CD headers of different sizes on the motherboard. These allow you to use the onboard sound for audio CD playback. Connect the audio cable from your CD drive to the header that fits your cable's connector. Only one CD header can be use at any one time. See the tables on the right for pin definitions.

Audio CD Header Pin Definitions (CD1)

Pin Number	Definition
1	Left Stereo Signal
2	Ground
3	Ground
4	Right Stereo Signal

Audio CD Header Pin Definitions (CD2)

Pin Number	Definition
1	Right Stereo Signal
2	Ground
3	Left Stereo Signal
4	Ground

Fan Headers

There are three fan headers on the P4SGA/P4SGL, which are designated CPU Fan, Chassis Fan 1 and Chassis Fan 2. The P4SGR/P4SGE also has an Overheat Fan. Connect the fan on your CPU heatsink to the CPU Fan header. See the table on the right for pin definitions.

Fan Header Pin Definitions (CPU, Chassis and Overheat)

Pin Number	Definition
1	Ground (black)
2	+12V (red)
3	Tachometer

Caution: These fan headers are DC power.

Chassis Intrusion

The Chassis Intrusion header is designated JL1. See the board layout in Chapter 1 for the location of JL1 and the table on the right for pin definitions.

Chassis Intrusion Pin Definitions (JL1)

Pin Number	Definition
1	Intrusion Input
2	Ground

Overheat LED (JOH1)

Connect an LED to the JOH1 header to provide warning of chassis overheating. See the table on the right for pin definitions.

Overheat LED Pin Definitions (JOH1)

Pin Number	Definition
1	+5V
2	OH Active

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located on J17. See the table on the right for pin definitions. (The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J17)

Pin Number	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Universal Serial Bus (USB)

Two Universal Serial Bus 2.0 connectors (USB0 and USB1) are provided for backpanel access. See the table on the right (above) for pin definitions. The P4SGA/P4SGL/P4SGR/P4SGE also provides four additional USB 2.0 headers on the motherboard, which may be used to provide front side chassis access (cables not included). These additional ports are labeled USB2, USB3, USB4 and USB5. See the tables on the right (below) for pin definitions.

USB0/USB1 Port Pin Definitions (J18/J19)

Pin#	Definition
1	+5V
2	P0-
3	P0+
4	Ground

USB2/4

Pin Number	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	Key

USB3/5

Pin Number	Definition
1	+5V
2	PO-
3	PO+
4	Ground
5	Ground

Wake-On-LAN

The Wake-On-LAN header is designated WOL on the motherboard. See the table on the right for pin definitions. You must enable the LAN Wake-Up setting in BIOS to use this function. (You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.)

Wake-On-LAN Pin Definitions (WOL)

Pin Number	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is desig-
nated JWOR. This function allows
your computer to receive and be
"awakened" by an incoming call when
in the suspend state. See the table on
the right for pin definitions. You must
also have a WOR card and cable to
use WOR.

Wake-On-Ring Pin Definitions
(JWOR1)

Pin Number	Definition
1	Ground
2	Wake-up

AC'97 Output (P4SGA/P4SGL)

AC'97 provides high quality onboard
audio. The P4SGA/P4SGL features 6-
channel sound for front L&R, rear
L&R, center and subwoofer speak-
ers. This feature is activated with
the Avanc software (on the CDROM
included with your motherboard).
Sound is then output through the Line
In, Line Out and MIC jacks (see at
right). Activate AC 97 with the "AC
97 Audio" setting in the Advanced
Chipset Features section of BIOS.

Front L&R / Rear L&R / Center & Subwoofer
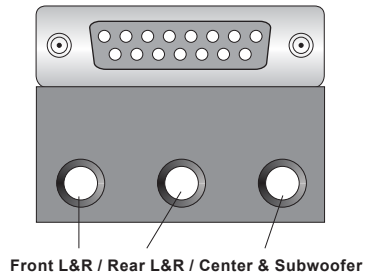
2-7   Jumper Settings

Explanation of Jumpers

To modify the operation of the motherboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the motherboard layout pages for jumper locations.
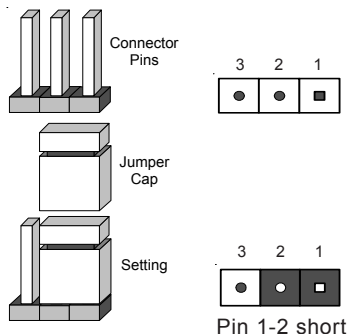
Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.

Connector Pins

Jumper Cap

Setting

3   2   1

3   2   1

Pin 1-2 short

CMOS Clear

JBT1 is used to clear CMOS. Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.
To clear CMOS,
1) First unplug the power cord(s) .
2) With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3) Remove the screwdriver (or shorting device).
4) Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

USB Wake-Up

Use JPUSB to enable or disable USB Wake-Up, which allows you to wakeup the system by depressing a key on the keyboard or by clicking the mouse when either is connected to the USB0 or USB1 port. This jumper is used together with the USB Wake-Up function in BIOS. Enable both the jumper and the BIOS setting to allow the system to be woken up. See the table on the right for jumper settings.

**USB Wake-Up
Jumper Settings
(JPUSB)**

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Watch Dog Enable/Disable

JP2 enables and disables the Watch Dog function. Watch Dog is a system monitor that will restart the system if a software application freezes operations. This jumper is used together with the Watch Dog enable function in BIOS. Enable both the jumper and the BIOS setting to use the Watch Dog feature. See the table on the right for jumper settings.

**Watch Dog Enable
Jumper Settings (JP2)**

Jumper Position	Definition
Open	Disabled
Closed	Enabled

Front Side Bus Speed

JP1 is used to set the system (front side) bus speed for the processors. It is best to keep this jumper set to Auto. Note that the P4SGL only supports 400 MHz FSB speed. This jumper is used together with the CPU Clock setting in BIOS. See the table on the right for jumper settings.

**Front Side Bus Speed
Jumper Settings (JP1)**

Jumper Position	Definition
Pins 1-2	Auto
Pins 2-3	400 MHz
Open	533 Mhz

Keyboard Wake-Up

The JPWAKE jumper is used to-
gether with the Keyboard Wake-
Up function in BIOS. Enable both
the jumper and the BIOS setting to
allow the system to be woken up
by depressing a key on the key-
board. See the table on the right
for jumper settings. Your power
supply must meet ATX specifica-
tion 2.01 or higher and supply 720
mA of standby power to use this
feature.

**Keyboard Wake-Up
Jumper Settings
(JPWAKE)**

Jumper Position	Definition
1-2	Disabled
2-3	Enabled

Speech Output Select
(P4SGA/P4SGL)

The system BIOS has a voice fea-
ture that it can use to inform you
of the POST (Power-On-Self-Test)
routine details. You can also pro-
gram your voice to give the BIOS
certain commands with the soft-
ware included on the Supermicro
CD that was included with your
motherboard. JP3 is used to direct
the BIOS voice output to either the
Line Out port or via the Speaker
header on JP2. The "Voice Warn-
ing Output" setting (in the Ad-
vanced BIOS Features section of
BIOS) must be enabled to use this
feature. See the table on the right
for jumper setting pin definitions.

**Speech Output Select
Jumper Settings (JP3)**

Jumper Position	Definition
1-2	Speaker
2-3	Line Out

LAN1 Enable/Disable
(P4SGR/P4SGE)

Change the setting of jumper JPL1
to enable or disable the onboard
LAN1 or NIC (Network Interface
Card) on the motherboard. See
the table on the right for jumper
settings. The default setting is
Enabled.

LAN1 (NIC)
Enable/Disable
Jumper Settings
(JPL1)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN2 Enable/Disable
(P4SGR/P4SGE)

Change the setting of jumper JPL2
to enable or disable the onboard
LAN2 or NIC (Network Interface
Card) on the motherboard. See
the table on the right for jumper
settings. The default setting is
Enabled.

LAN2 (NIC)
Enable/Disable
Jumper Settings
(JPL2)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SCSI Enable/Disable
(P4SGR)

The SCSI Termination jumper at
JPA3 allows you to enable or dis-
able the onboard SCSI controller.
The normal (default) position is on
to enable SCSI termination. See
the table on the right for jumper
settings.

SCSI Enable/Disable
Jumper Settings
(JPA3)

Jumper Position	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

SCSI Channel A/B Termination Enable/Disable (P4SGR)

Jumpers JPA1 and JPA2 allow you to enable or disable termination for the individual SCSI channels. Jumper JPA1 controls SCSI channel A and JPA2 controls SCSI channel B. The normal (default) setting is open to enable (teminate) both SCSI channels. If you wish to connect external SCSI devices, you should disable termination for the channnnel(s) you will be connecting them to. See the table on the right for jumper settings.

SCSI Channel Termination Enable/Disable Jumper Settings (JPA1, JPA2)

Jumper Position	Definition
Open	Enabled
Closed	Disabled

Chassis/Overheat Fan Select (P4SGR/P4SGE)

JP3 allows you to select between use of the Chassis fan and the Overheat fan. The default position is open to select the Overheat fan. The CPU Chassis fan is intended for use with Supermicro chassis. A closed jumper setting forces the chassis fan to always be on. See the table on the right for jumper settings.

Chassis/Overheat Fan Select Jumper Settings (JP3)

Jumper Position	Definition
Closed	Chassis Fan
Open	Overheat Fan

2-8 Game Port, Parallel Port, Floppy Drive, Hard Drive and AGP Connections

Use the following information to connect the floppy and hard disk drive cables.

• The floppy disk drive cable has seven twisted wires.

• A red mark on a wire typically designates the location of pin 1.

• A single floppy disk drive ribbon cable has 34 wires and two connectors to provide for two floppy disk drives. The connector with twisted wires always connects to drive A, and the connector that does not have twisted wires always connects to drive B.

• The 80-wire ATA100/66 IDE hard disk drive cable that came with your system has two connectors to support two drives. This special cable should be used to take advantage of the speed this new technology offers. The blue connector connects to the onboard IDE connector inter-face and the other connector(s) to your hard drive(s). Consult the docu-mentation that came with your disk drive for details on actual jumper locations and settings for the hard disk drive.

Game Port Connector (P4SGA/P4SGL)

The game port is the gold port on the I/O backplane. See the table on the right for pin definitions.

Game Port Pin Definitions (GAME PORT)

Pin Number	Function	Pin Number	Function
1	+5V fused	2	GP4 (JSBUTO)
3	GP0 (JSX1R)	4	Ground
5	Ground	6	GP1 (JSY1R)
7	GP5 (JSBUT1)	8	+5V fused
9	+5V fused	10	GP6 (JSBUT2)
11	GP2 (JSX2R)	12	MIDI-OUTR
13	GP3 (JSY2R)	14	GP7 (JSBUT3)
15	MIDI-INR		

Parallel Port Connector

The parallel port is located on J15. See the table on the right for pin definitions.

Parallel (Printer) Port Pin Definitions (J15)

Pin Number	Function	Pin Number	Function
1	Strobe-	2	Auto Feed-
3	Data Bit 0	4	Error-
5	Data Bit 1	6	Init-
7	Data Bit 2	8	SLCT IN-
9	Data Bit 3	10	GND
11	Data Bit 4	12	GND
13	Data Bit 5	14	GND
15	Data Bit 6	16	GND
17	Data Bit 7	18	GND
19	ACK	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Ultra160 SCSI Connectors (P4SGR)

Refer to the table on the right for the pin definitions of the Ultra160 SCSI connectors located at JA1, JA2 and JA3.

68-pin Ultra160 SCSI Connectors (JA1, JA2, JA3)

Connector Contact Number	Signal Names	Connector Contact Number	Signal Names
1	+DB(12)	35	-DB(12)
2	+DB(13)	36	-DB(13)
3	+DB(14)	37	-DB(14)
4	+DB(15)	38	-DB(15)
5	+DB(P1)	39	-DB(P1)
6	+DB(0)	40	-DB(0)
7	+DB(1)	41	-DB(1)
8	+DB(2)	42	-DB(2)
9	+DB(3)	43	-DB(3)
10	+DB(4)	44	-DB(4)
11	+DB(5)	45	-DB(5)
12	+DB(6)	46	-DB(6)
13	+DB(7)	47	-DB(7)
14	+DB(P)	48	-DB(P)
15	GROUND	49	GROUND
16	DIFFSENS	50	GROUND
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	RESERVED	53	RESERVED
20	GROUND	54	GROUND
21	+ATN	55	-ATN
22	GROUND	56	GROUND
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB(8)	65	-DB(8)
32	+DB(9)	66	-DB(9)
33	+DB(10)	67	-DB(10)
34	+DB(11)	68	-DB(11)

Floppy Connector

The floppy connector is located on JP5. See the table on the right for pin definitions.

Floppy Connector Pin Definitions (JP5)

Pin Number	Function	Pin Number	Function
1	GND	2	FDHDIN
3	GND	4	Reserved
5	Key	6	FDEDIN
7	GND	8	Index-
9	GND	10	Motor Enable
11	GND	12	Drive Select B-
13	GND	14	Drive Select A-
15	GND	16	Motor Enable
17	GND	18	DIR-
19	GND	20	STEP-
21	GND	22	Write Data-
23	GND	24	Write Gate-
25	GND	26	Track 00-
27	GND	28	Write Protect-
29	GND	30	Read Data-
31	GND	32	Side 1 Select-
33	GND	34	Diskette

IDE Connector Pin Definitions
(J6, J7)

| Pin Number	Function	Pin Number	Function
1	Reset IDE	2	GND
3	Host Data 7	4	Host Data 8
5	Host Data 6	6	Host Data 9
7	Host Data 5	8	Host Data 10
9	Host Data 4	10	Host Data 11
11	Host Data 3	12	Host Data 12
13	Host Data 2	14	Host Data 13
15	Host Data 1	16	Host Data 14
17	Host Data 0	18	Host Data 15
19	GND	20	Key
21	DRQ3	22	GND
23	I/O Write-	24	GND
25	I/O Read-	26	GND
27	IOCHRDY	28	BALE
29	DACK3-	30	GND
31	IRQ14	32	IOCS16-
33	Addr 1	34	GND
35	Addr 0	36	Addr 2
37	Chip Select 0	38	Chip Select 1-
39	Activity	40	GND

IDE Connectors

There are no jumpers to config-
ure the onboard IDE interfaces
J6 and J7. See the table on the
left for pin definitions. You
must use the ATA100/66 cable
included with your system to
benefit from the ATA100/66
technology.

1.5V 4xAGP Slot (P4SGA/P4SGR/P4SGE)

The 4xAGP slot is not included on the P4SGL. You should first disable
the integrated video in BIOS before adding a VGA card to this slot. (See
the "On-Chip VGA" setting in the Advanced Chipset Features section in
BIOS.) The 4xAGP slot is backward compatible with 2xAGP graphics
cards.

To install a VGA card, power down the system and remove the I/O shield
corresponding to the AGP slot. Then, pull back the locking tab on the slot
before inserting your VGA card. After the card is inserted, close the
locking tab if possible (some VGA cards have a notch in the corner of
the board to lock it into place, others do not.) Replace all chassis covers
before restoring power to the system.

Locking Tab
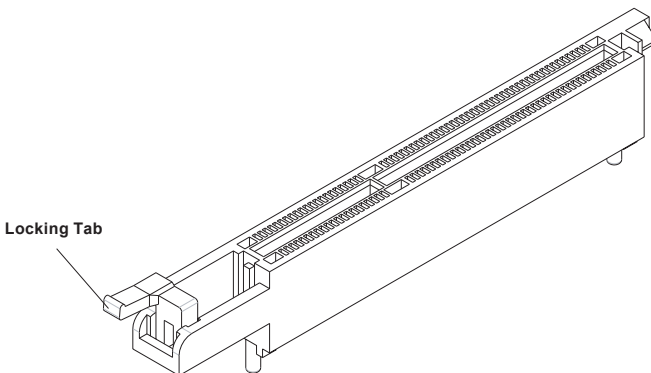
2-9   Installing Software

After all the hardware has been installed, you must install, first of all, the operating system, and then, the software drivers. The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard. After inserting this CD into your CDROM drive, the display shown in Figure 2-5 should appear. (If this display does not appear, click on the My Computer icon and then on the icon representing your CDROM drive. Finally, double click on the S "Setup" icon.)
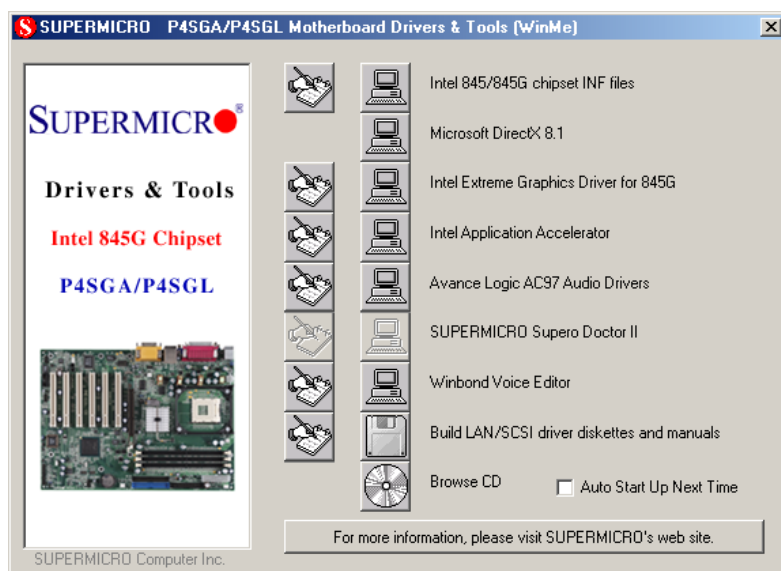

Figure 2-5. Driver/Tool Installation Display Screen

Click the icons showing a hand writing on paper to view the readme files for each item. Click the computer icons to the right of these *in order from top to bottom* to install each item one at a time. **After installing each item, you must reboot the system before moving on to the next item on the list.** You should install everything here except for the SUPER Doctor utility and the LAN/SCSI driver diskettes, which are optional. The Security and Graphics Drivers support multiple languages. Click the arrows to pull down a menu of choices. The bottom icon with a CD on it allows you to view the entire contents of the CD. **Note:** The memory size reported in the device manager may be less than expected because some is used by the onboard graphics. Higher screen resolutions will take up more of this memory.